gas temperature of chlorinated brine scrubbers and hypochlorite scrubbers;

(v) The liquid flow rate and exit gas temperature for water scrubbers;

(vi) The inlet gas temperature of regenerative carbon adsorption systems; and

(vii) The temperature during the heating phase of the regeneration cycle for carbon adsorbers or molecular sieves.

(2) To establish a maximum monitoring value or minimum monitoring value, as appropriate for your final control device, you must average the recorded parameters in paragraphs (f)(1)(i) through (vi) of this section over the test period. If your final control device is a regenerative carbon adsorber, you must use the highest temperature reading measured in paragraph (f)(1)(vii) as the reference temperature in § 63.8244(b)(2)(v).

§ 63.8234 What equations and procedures must I use for the initial compliance demonstration?

(a) *By-product hydrogen streams and end box ventilation system vents.* You must determine the total grams of mercury per Megagram of chlorine production (g Hg/Mg Cl_2) of chlorine produced from all by-product hydrogen streams and all end box ventilation system vents, if applicable, at a mercury cell chlor-alkali production facility, and you must follow the procedures in paragraphs (a)(1) through (6) of this section.

(1) Determine the mercury emission rate for each test run in grams per day for each by-product hydrogen stream and for each end box ventilation system vent, if applicable, from Method 101, 101A, or 102 (40 CFR part 61, appendix A).

(2) Calculate the average measured electric current through the operating mercury cells during each test run for each by-product hydrogen stream and for each end box ventilation system vent, if applicable, using Equation 1 of this section as follows:

$$CL_{avg,\ run} = \frac{\sum_{i=1}^{n} CL_{i,\ run}}{n} \qquad \text{(Eq. 1)}$$

Where:

$CL_{avg,\ run}$ = Average measured cell line current load during the test run, amperes;

$CL_{i,\ run}$ = Individual cell line current load measurement (*i.e.*, 15 minute reading) during the test run, amperes; and

n = Number of cell line current load measurements taken over the duration of the test run.

(3) Calculate the amount of chlorine produced during each test run for each by-product hydrogen stream and for each end box ventilation system vent, if applicable, using Equation 2 of this section as follows:

$$P_{Cl_2,\ run} = \left(1.3\times10^{-6}\right)\left(CL_{avg,\ run}\right)\left(n_{cells,\ run}\right)\left(t_{run}\right) \qquad \text{(Eq. 2)}$$

Where:

$P_{Cl_2,run}$ = Amount of chlorine produced during the test run, megagrams chlorine (Mg Cl_2);

1.3×10^{-6} = Theoretical chlorine production rate factor, Mg Cl_2 per hour per ampere per cell;

$CL_{avg,run}$ = Average measured cell line current load during test run, amperes, calculated using Equation 1 of this section;

$n_{cell,run}$ = Number of cells on-line during the test run; and

t_{run} = Duration of test run, hours.

(4) Calculate the mercury emission rate in grams of mercury per megagram of chlorine produced for each test run for each by-product hydrogen stream and for each end box ventilation system vent, if applicable, using Equation 3 of this section as follows:

$$E_{Hg,\ run} = \left[\frac{\left(R_{run}\right)\left(t_{run}\right)}{(24)\left(P_{Cl_2,\ run}\right)}\right] \qquad \text{(Eq. 3)}$$

Where:

$E_{Hg,run}$ = Mercury emission rate for the test run, g Hg/Mg Cl_2;

R_{run} = Measured mercury emission rate for the test run from paragraph (a)(1) of this section, grams Hg per day;

t_{run} = Duration of test run, hours;

24 = Conversion factor, hours per day; and

$P_{Cl_2,run}$ = Amount of chlorine produced during the test run, calculated using Equation 2 of this section, Mg Cl_2.

(5) Calculate the average mercury emission rate for each by-product hydrogen stream and for each end box ventilation system vent, if applicable, using Equation 4 of this section as follows:

$$E_{Hg,\,avg} = \frac{\sum_{i=1}^{n} E_{Hg,\,run}}{n} \qquad \text{(Eq. 4)}$$

Where:

$E_{Hg,avg}$ = Average mercury emission rate for the by-product hydrogen stream or the end box ventilation system vent, if applicable, g Hg/Mg Cl_2;

$E_{Hg,run}$ = Mercury emission rate for each test run for the by-product hydrogen stream or the end box ventilation system vent, if applicable, g Hg/Mg Cl_2, calculated using Equation 3 of this section; and

n = Number of test runs conducted for the by-product hydrogen stream or the end box ventilation system vent, if applicable.

(6) Calculate the total mercury emission rate from all by-product hydrogen streams and all end box ventilation system vents, if applicable, at the mercury cell chlor-alkali production facility using Equation 5 of this section as follows:

$$E_{Hg,\,H_2EB} = \sum_{i=1}^{n} E_{Hg,\,avg} \qquad \text{(Eq. 5)}$$

Where:

E_{Hg,H_2EB} = Total mercury emission rate from all by-product hydrogen streams and all end box ventilation system vents, if applicable, at the affected source, g Hg/Mg Cl_2;

$E_{Hg,avg}$ = Average mercury emission rate for each by-product hydrogen stream and each end box ventilation system vent, if applicable, g Hg/Mg Cl_2, determined using Equation 4 of this section; and

n = Total number of by-product hydrogen streams and end box ventilation system vents at the affected source.

(b) *Mercury thermal recovery vents.* You must determine the milligrams of mercury per dscm exhaust discharged from mercury thermal recovery unit vents, using the procedures in paragraphs (b)(1) and (2) of this section.

(1) Calculate the concentration of mercury in milligrams of mercury per dscm of exhaust for each test run for each mercury thermal recovery unit vent using Equation 6 of this section as follows:

$$C_{Hg,\,run} = \left[\frac{(m_{Hg})(10^{-3})}{(V_{m_{(std)}})}\right] \qquad \text{(Eq. 6)}$$

Where:

$C_{Hg,run}$ = Mercury concentration for the test run, milligrams of mercury per dry standard cubic meter of exhaust;

m_{Hg} = Mass of mercury in test run sample, from Method 101, 101A, or 102, micrograms;

10-3 = Conversion factor, milligrams per microgram; and

$V_{m(std)}$ = Dry gas sample volume at standard conditions, from Method 101, 101A, or 102, dry standard cubic meters.

(2) Calculate the average concentration of mercury in each mercury thermal recovery unit vent exhaust using Equation 7 of this section as follows:

$$C_{Hg,\,avg} = \frac{\sum_{i=1}^{n} C_{Hg,\,run}}{n} \qquad \text{(Eq. 7)}$$

Where:

$C_{Hg,avg}$ = Average mercury concentration for the mercury thermal recovery unit vent, milligrams of mercury per dry standard cubic meter exhaust;

$C_{Hg,run}$ = Mercury concentration for each test run, milligrams of mercury per dry standard cubic meter of exhaust, calculated using Equation 6 of this section; and

n = Number of test runs conducted for the mercury thermal recovery unit vent.

§ 63.8236 How do I demonstrate initial compliance with the emission limitations and work practice standards?

(a) For each mercury cell chlor-alkali production facility, you have demonstrated initial compliance with the applicable emission limit for by-product hydrogen streams and end box ventilation system vents in § 63.8190(a)(2) if you comply with paragraphs (a)(1) and (2) of this section:

(1) Total mercury emission rate from all by-product hydrogen streams and all end box ventilation system vents, if applicable, at the affected source, determined according to §§ 63.8232 and 63.8234(a), did not exceed the applicable